

WHAT IS CLAIMED IS:

1 1. An active power filter, comprising:
2 a feedback resistor having first and second terminals;
3 a shunt capacitor having positive and negative terminals;
4 an operational amplifier equivalent subcircuit having positive and negative
5 input terminals and having an output terminal; and
6 a voltage drop source having positive and negative terminals;
7 wherein the positive terminal of the shunt capacitor is coupled to a positive
8 terminal of a noisy load device and to a positive terminal of a low noise direct current power
9 supply;
10 wherein the negative terminal of the shunt capacitor is coupled to the second
11 terminal of the feedback resistor and to the positive input terminal of the operational
12 amplifier equivalent subcircuit;
13 wherein the first terminal of the feedback resistor is coupled to the negative
14 terminal of the noisy load device and to the output terminal of the operational amplifier
15 equivalent subcircuit;
16 wherein the positive terminal of the voltage drop source is coupled to the
17 negative terminal of the operational amplifier equivalent subcircuit;
18 wherein the negative terminal of the voltage drop source is coupled to a
19 negative terminal of the low noise direct current power supply.

1 2. An active power filter as in claim 1, wherein the operational amplifier
2 equivalent subcircuit comprises:
3 an operational amplifier having positive and negative input terminals and
4 having an output terminal;
5 a first resistor having first and second terminals;
6 a second resistor having first and second terminals; and
7 a transistor having a gate, a source, and a drain;
8 wherein the positive input terminal of the operational amplifier forms the
9 positive input terminal of the operational amplifier equivalent subcircuit;

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10 wherein the drain of the transistor forms the output terminal of the operational
11 amplifier equivalent subcircuit;
12 wherein the first terminal of the first resistor is coupled to the negative
13 terminal of the operational amplifier;
14 wherein the second terminal of the first resistor forms the negative terminal of
15 the operational amplifier equivalent subcircuit;
16 wherein the first terminal of the second resistor is coupled to the gate of the
17 transistor; and
18 wherein the second terminal of the second resistor is coupled to output
19 terminal of the operational amplifier.

1 3. An active power filter as in claim 2,
2 wherein the source of the transistor is coupled to the negative terminal of the
3 voltage drop source.

1 4. An active power filter as in claim 2, wherein the operational amplifier
2 equivalent subcircuit further includes:
3 a first capacitor having first and second terminals;
4 wherein the first terminal of the first capacitor is coupled to the output
5 terminal of the operational amplifier; and
6 wherein the second terminal of the first capacitor is coupled to the negative
7 input terminal of the operational amplifier.

1 5. An active power filter as in claim 4, wherein the operational amplifier
2 equivalent subcircuit further includes:
3 a second capacitor having first and second terminals;
4 wherein the first terminal of the second capacitor is coupled to the gate of the
5 transistor; and
6 wherein the second terminal of the second capacitor is coupled to the output
7 terminal of the operational amplifier.

1 6. An active power filter as in claim 5, wherein the operational amplifier
2 equivalent subcircuit further includes:
3 a third capacitor; and
4 a third resistor;

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5 wherein the third capacitor and the third resistor are connected in series
6 between the gate of the transistor and the negative terminal of the voltage drop source.

1 7. An active power filter as in claim 2, wherein the transistor comprises
2 an N-channel enhancement mode MOS field effect transistor.

1 8. An active power filter as in claim 1, wherein the noisy load comprises
2 a switching DC to DC converter.

1 9. An active power filter as in claim 1, wherein the noisy load comprises
2 a brushless DC fan.

1 10. An active power filter as in claim 1, wherein the noisy load comprises
2 a switching logic circuit.

1 11. An active power filter as in claim 1,
2 wherein an impedance of the active power filter is large in comparison to an
3 impedance of the noisy load at a minimum noise frequency generated by the noisy load.

1 12. An active power filter, comprising:
2 a feedback resistor having first and second terminals;
3 a shunt capacitor having positive and negative terminals;
4 an operational amplifier equivalent subcircuit having positive and negative
5 input terminals and having an output terminal; and
6 a voltage drop source having positive and negative terminals;
7 wherein the positive terminal of the shunt capacitor is coupled to a positive
8 terminal of a low noise load device and to a positive terminal of a noisy direct current power
9 supply;

10 wherein the negative terminal of the shunt capacitor is coupled to the second
11 terminal of the feedback resistor and to the positive input terminal of the operational
12 amplifier equivalent subcircuit;

13 wherein the first terminal of the feedback resistor is coupled to the negative
14 terminal of the low noise load device and to the output terminal of the operational amplifier
15 equivalent subcircuit;

16 wherein the positive terminal of the voltage drop source is coupled to the
17 negative terminal of the operational amplifier equivalent subcircuit;

- 18 wherein the negative terminal of the voltage drop source is coupled to a
19 negative terminal of the noisy direct current power supply.

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